

# BPX 89

## Array Linear

Silicon NPN Phototransistor Arrays



## Applications

- Industrial Automation (Machine controls, Light barriers, Vision controls)

## Features:

- Package: clear epoxy
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)
- Spectral range of sensitivity: (typ) 450 ... 1100 nm
- Multiple-digit array package
- High linearity
- Available in groups

## Ordering Information

Type	Photocurrent $V_{CE} = 5 \text{ V}; \lambda = 950 \text{ nm}; E_e = 0.5 \text{ mW/cm}^2$ $I_{PCE}$	Ordering Code
BPX 89	320 ... 1000 $\mu\text{A}$	Q62702P0026

Only one bin within one packing unit (variation less than 2:1)

## Maximum Ratings

$T_A = 25\text{ °C}$

Parameter	Symbol		Values
Operating temperature	$T_{op}$	min. max.	-40 °C 80 °C
Storage temperature	$T_{stg}$	min. max.	-40 °C 80 °C
Collector-emitter voltage	$V_{CE}$	max.	35 V
Collector current	$I_C$	max.	50 mA
Collector surge current $\tau \leq 10\ \mu\text{s}$	$I_{CS}$	max.	200 mA
Emitter-collector voltage	$V_{EC}$	max.	7 V
Total power dissipation	$P_{tot}$	max.	90 mW
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)	$V_{ESD}$	max.	2 kV

## Characteristics

$T_A = 25\text{ °C}$

Parameter	Symbol		Values
Number of detectors	n		9
Dimension "B" (see drawing)	l	max. min.	22.7 mm 22.3 mm
Wavelength of max sensitivity	$\lambda_{S\text{ max}}$	typ.	850 nm
Spectral range of sensitivity	$\lambda_{10\%}$	typ.	450 ... 1100 nm
Chip dimensions	L x W	typ.	0.55 x 0.55 mm x mm
Radiant sensitive area	A	typ.	0.11 mm <sup>2</sup>
Half angle	$\varphi$	typ.	18 °
Photocurrent $V_{CE} = 5\text{ V}$ ; Std. Light A; $E_v = 1000\text{ lx}$	$I_{PCE}$	typ.	1900 $\mu\text{A}$
Dark current $V_{CE} = 20\text{ V}$ ; $E = 0$	$I_{CE0}$	typ. max.	1 nA 50 nA
Rise time $I_C = 1\text{ mA}$ ; $V_{CC} = 5\text{ V}$ ; $R_L = 1\text{ k}\Omega$	$t_r$	typ.	6 $\mu\text{s}$
Fall time $I_C = 1\text{ mA}$ ; $V_{CC} = 5\text{ V}$ ; $R_L = 1\text{ k}\Omega$	$t_f$	typ.	6 $\mu\text{s}$
Collector-emitter saturation voltage <sup>1)</sup> $I_C = I_{PCE,\text{min}} \times 0.3$ ; $E_e = 0.5\text{ mW/cm}^2$	$V_{CE\text{sat}}$	typ.	150 mV
Capacitance $V_{CE} = 0\text{ V}$ ; $f = 1\text{ MHz}$ ; $E = 0$	$C_{CE}$	typ.	7.5 pF
Thermal resistance junction ambient real	$R_{thJA}$	max.	750 K / W

## Grouping

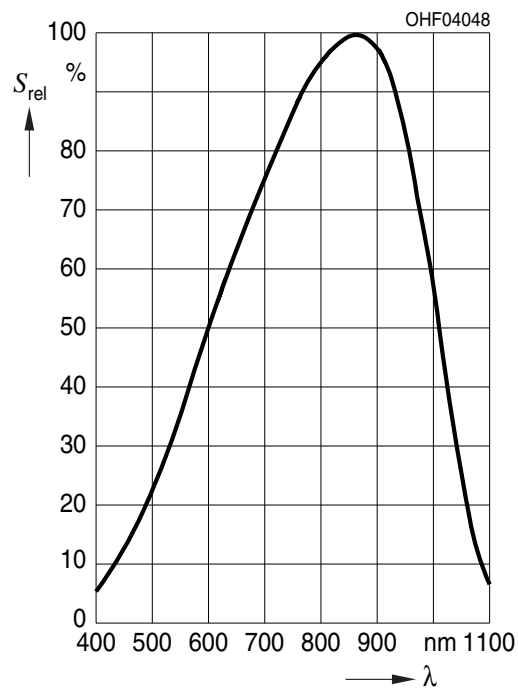
$$T_A = 25\text{ °C}$$

Group	Photocurrent $V_{CE} = 5\text{ V}; \lambda = 950\text{ nm}; E_e = 0.5\text{ mW/cm}^2$ min.	Photocurrent $V_{CE} = 5\text{ V}; \lambda = 950\text{ nm}; E_e = 0.5\text{ mW/cm}^2$ max.
	$I_{PCE}$	$I_{PCE}$
A	320 $\mu\text{A}$	630 $\mu\text{A}$
B	400 $\mu\text{A}$	800 $\mu\text{A}$
C	500 $\mu\text{A}$	1000 $\mu\text{A}$

For delivery the components are marked -A, -B, -C. Due to differing yields it is not possible to order a definite group.

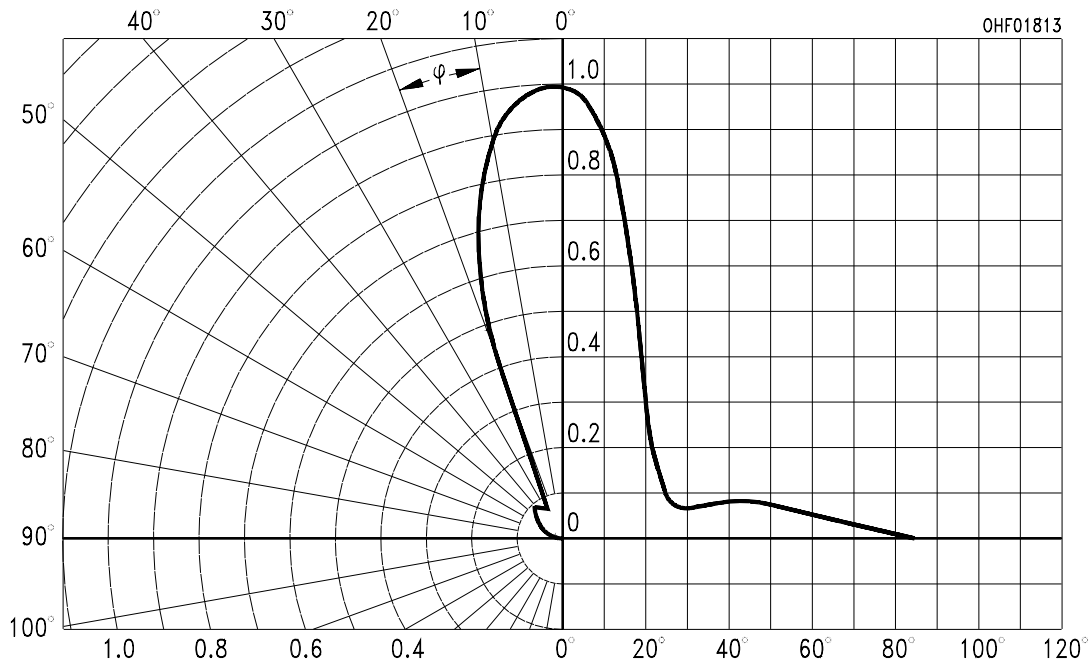
## Relative Spectral Sensitivity <sup>2), 3)</sup>

$$S_{rel} = f(\lambda)$$



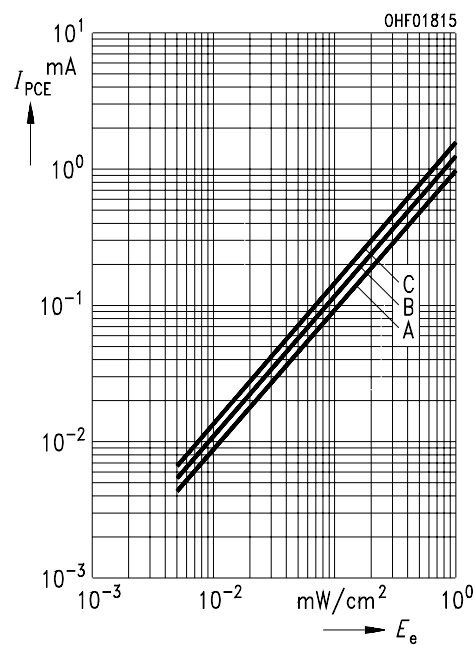
### Directional Characteristics <sup>2), 3)</sup>

$$S_{rel} = f(\varphi)$$



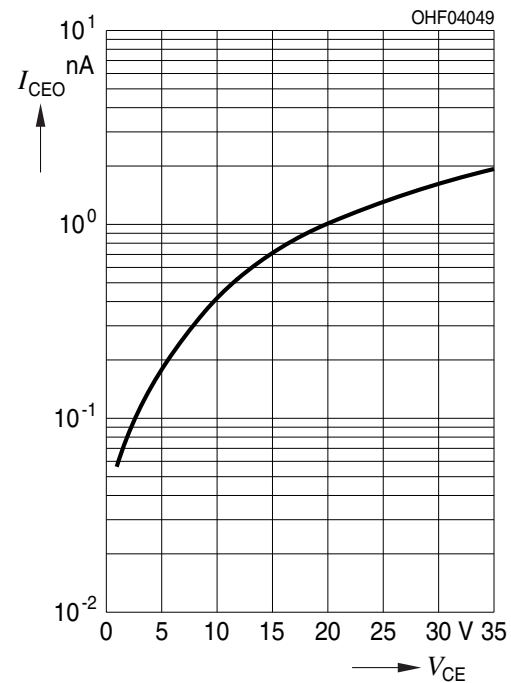
### Photocurrent <sup>2), 3)</sup>

$$I_{PCE} = f(E_e); V_{CE} = 5 V$$



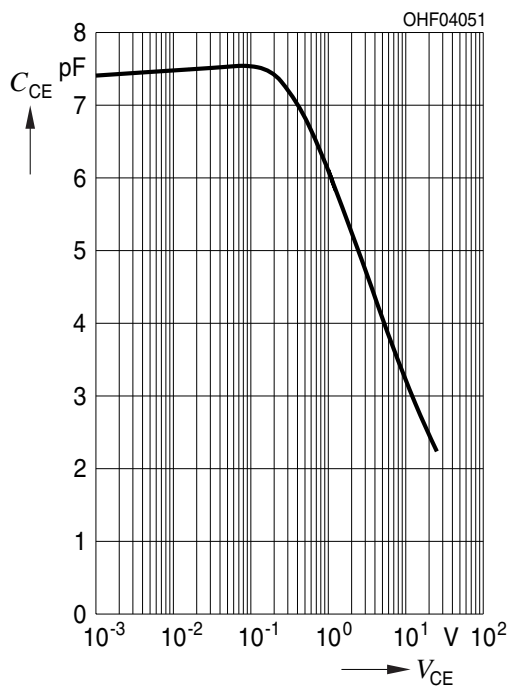
### Dark Current <sup>2), 3)</sup>

$$I_{CEO} = f(V_{CE}); E = 0;$$



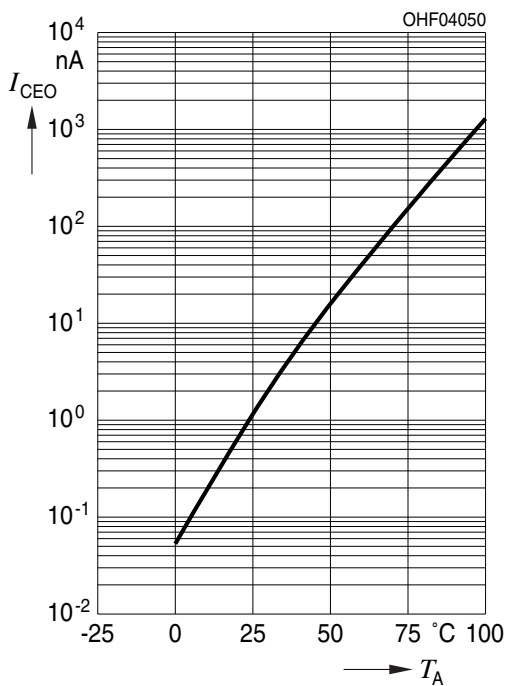
### Collector-Emitter Capacitance <sup>2), 3)</sup>

$$C_{CE} = f(V_{CE}); f = 1 \text{ MHz}; E = 0 ;$$



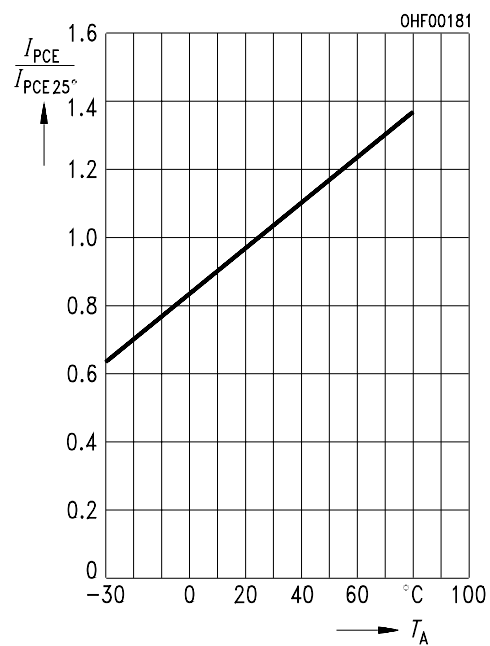
### Dark Current <sup>2)</sup>

$$I_{CE0} = f(T_A); E = 0$$



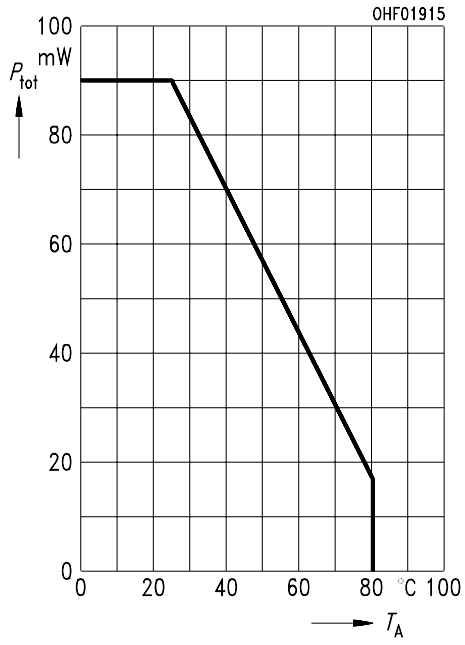
### Photocurrent <sup>2)</sup>

$$I_{PCE,rel} = f(T_A); V_{CE} = 5 \text{ V}$$

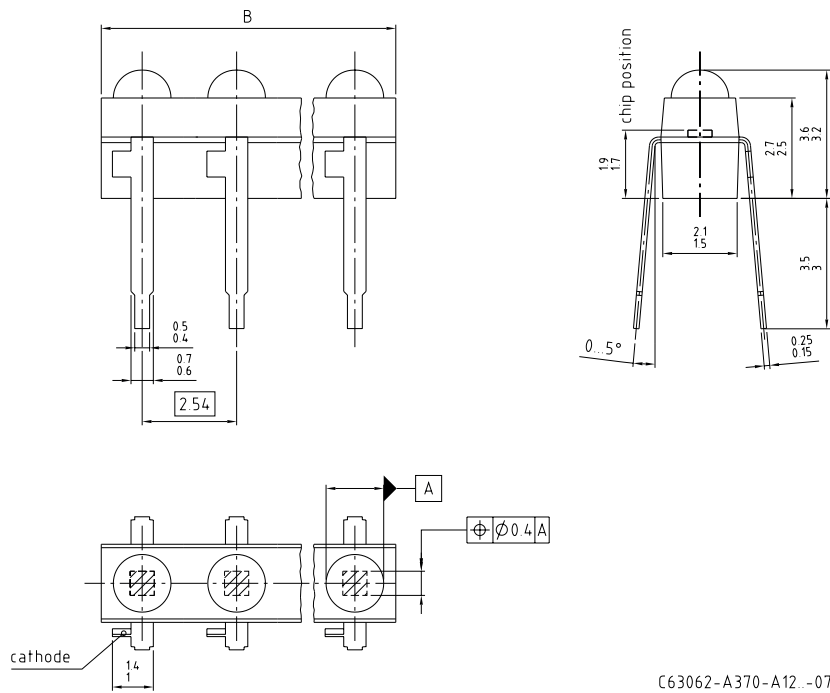


## Power Consumption

$$P_{\text{tot}} = f(T_A); R_{\text{thJA}} = 750 \text{ K / W}$$



Dimensional Drawing <sup>4)</sup>



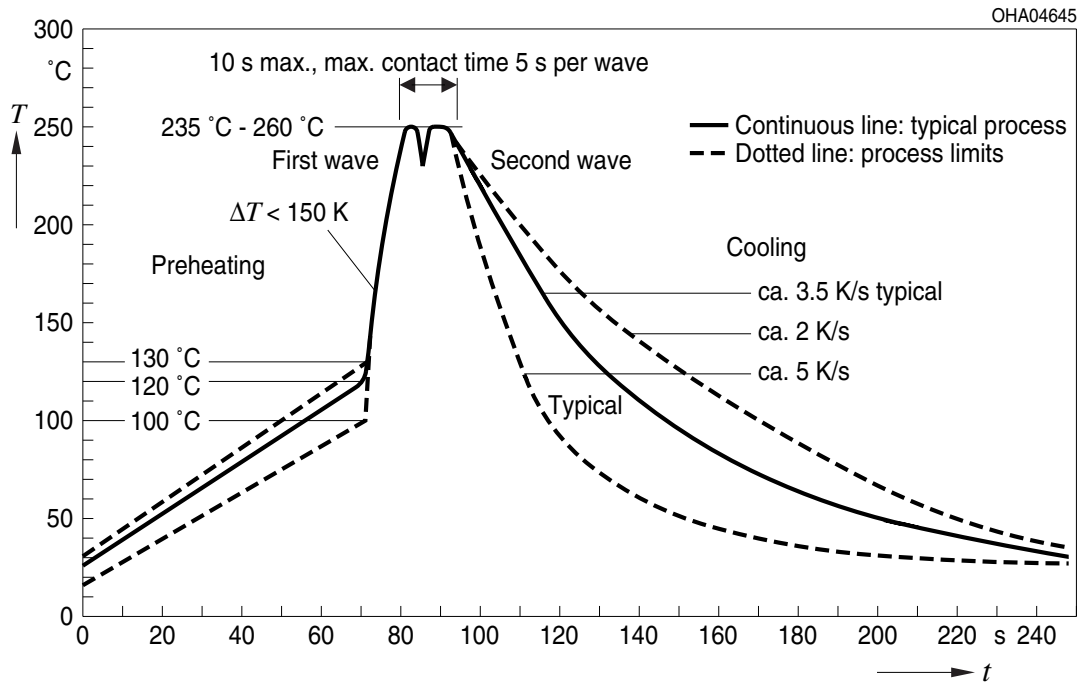
**Approximate Weight:** 216.0 mg

**Package marking:** Cathode



## TTW Soldering

IEC-61760-1 TTW



## Disclaimer

### Disclaimer

Language english will prevail in case of any discrepancies or deviations between the two language wordings.

### Attention please!

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## Glossary

- 1) **IPCEmin:**  $I_{\text{PCEmin}}$  is the min. photocurrent of the specified group.
- 2) **Typical Values:** Due to the special conditions of the manufacturing processes of LED, the typical data or calculated correlations of technical parameters can only reflect statistical figures. These do not necessarily correspond to the actual parameters of each single product, which could differ from the typical data and calculated correlations or the typical characteristic line. If requested, e.g. because of technical improvements, these typ. data will be changed without any further notice.
- 3) **Testing temperature:**  $T_A = 25^\circ\text{C}$
- 4) **Tolerance of Measure:** Unless otherwise noted in drawing, tolerances are specified with  $\pm 0.1$  and dimensions are specified in mm.

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